Step 3. The moment requirement, using Eq. (3), is then:

$M = 369.6/4.5 = 82.2$ kip-in.

Repeating the calculations shown in Design Example No. 1 with this moment, it is found:

Use: Four ¾-in. diam. A307 anchor bolts (minimum)
Base plate 15 × 1 × 1 ft-3 in.
Footing 5 ft-0 in. square

Step 4. Check base stiffness to verify $G_{bottom} \leq 4.5$:

Footing, using Eq. (1):

$$\frac{I}{L} = \frac{150 \times 60^4}{2{,}088 \times 10^6} = 0.931 \text{ (controls)}$$

Base plate, using Eq. (2):

$$\frac{I}{L} = \frac{15^3}{72 \times 9} = 5.21$$

$$G_{bottom} = \frac{(72.5/20) \times 12}{0.931} = 0.33 < 4.5 \text{ o.k.}$$

SUMMARY

The Alignment Chart does not provide the designer with a method of making an engineered evaluation of column bases, merely giving limit recommendations. Presented are simple and approximate methods, which allow the designer to do this. Although not included for the sake of simplicity of illustration, these methods are equally suitable for the design of columns with wind or other lateral loads.

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2. *Galambos, Theodore V.* Influence of Partial Base Fixity on Frame Stability *Journal of the Structural Division, ASCE, May 1960*
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4. *DeFalco, Fred and Marino, Frank J.* Column Stability in Type 2 Construction *Engineering Journal, American Institute of Steel Construction, April, 1966.*
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